Clean Copy of New Claims

Claim 1 (amended): A balancer for use in combination with a rotating assembly, said balancer comprising:

at least one movable member which is removably deployed upon said rotating assembly and which is effective to selectively balance said rotating assembly; and

a controller, coupled to said movable member and adapted to calculate an influence coefficient value and to periodically modify said influence coefficient value and to cause said movable member to move in accordance with said calculated influence coefficient value and said modified value effective to balance said rotating assembly, wherein said influence coefficient value is calculated by recursive exponentially weighted averaging and two adaptive parameters which are adjusted during each of a plurality of control iterations.

Claim 19 (canceled) The balancer of claim 1 wherein said influence coefficient value is calculated by recursive exponentially weighted averaging and two adaptive parameters which are adjusted during each of a plurality of control iterations.

Claim 20 (previously presented): A balancer for use in combination with a rotating assembly, said balancer comprising:

at least one movable member which is removably deployed upon said rotating assembly and which is effective to selectively balance said rotating assembly; and

a controller, coupled to said movable member and adapted to calculate an influence coefficient value and to adjust two adaptive parameters during at least two control iterations, wherein said controller is effective to cause said at least one movable member to move in

accordance with said influence coefficient value and said two adaptive parameters to balance said rotating assembly.

Claim 21 (previously presented): The balancer of claim 20 wherein said controller calculates said influence coefficient value through recursive exponentially weighted averaging.

Claim 22 (previously presented): The balancer of claim 20 wherein said two adaptive parameters are a gain parameter and a forgetting factor.

Claim 23 (previously presented): The balancer of claim 22 wherein said gain parameter is within a range of zero to one in value.

Claim 24 (previously presented): The balancer of claim 22 wherein said forgetting factor is within a range of zero to one in value.

Claim 25 (previously presented): The balancer of claim 22 wherein said controller automatically adjusts both said gain parameter and said forgetting factor during each of said control iterations.

Claim 26 (previously presented): The balancer of claim 20 further comprising at least one vibration sensor which is communicatively coupled to said controller and is disposed in close proximity to said rotating assembly, wherein said at least one vibration sensor communicates an amount of imbalance of said rotating assembly to said controller.

Claim 27 (previously presented): The balancer of claim 26 wherein said controller calculates said influence coefficient value using said amount of imbalance.

Claim 28 (previously presented): The balancer of claim 26 wherein said amount of imbalance is communicated as a complex phasor having a certain phase angle.

Claim 29 (previously presented): A balancer for use in combination with a rotating tool assembly, which rotates at a certain cutting speed and has a certain amount of imbalance at said certain cutting speed, said balancer comprising:

at least one movable member which is deployed upon said tool assembly, said at least one movable member having a certain weight distribution, wherein said at least one movable member is effective to be repositioned upon said tool assembly to cause said certain weight distribution to balance said amount of imbalance;

a vibration sensor which is effective to determine said amount of imbalance and to generate an error signal which represents said amount of imbalance; and

a controller which is coupled to said at least one movable member and said vibration sensor, wherein said controller receives said error signal and calculates an influence coefficient value to select an adaptive gain parameter and an adaptive forgetting factor which are used to calculate a position at which said at least one movable member is moved upon said tool assembly in order to balance said tool assembly.

Claim 30 (previously presented): The balancer of claim 29 wherein said controller calculates said influence coefficient value at said certain cutting speed.

Claim 31 (previously presented): The balancer of claim 29 wherein said gain parameter is within a range of zero to one in value.

Claim 32 (previously presented): The balancer of claim 29 wherein said forgetting factor is within a range of zero to one in value.

Claim 33 (previously presented): The balancer of claim 29 wherein said controller automatically adjusts both said gain parameter and said forgetting factor during each of a plurality of control iterations.

Claim 34 (amended): A method for balancing a rotatable tool assembly, said method comprising the steps of:

measuring an amount of imbalance within said tool assembly during a certain control interval;

calculating an influence coefficient value during said certain control interval;

adjusting two adaptive parameters based upon said calculated influence coefficient;

providing a balancing rotor which may be removably deployed upon said tool assembly;

defining a correction movement of said balancing rotor as a function of said influence coefficient value; and

causing said balancing rotor to follow said correction movement.

Claim 35 (previously presented): The method of claim 34 wherein said two adaptive parameters are a gain parameter and a forgetting factor.

Claim 36 (amended): The method of claim 35 wherein said step of adjusting two adaptive parameters based upon said calculated influence coefficient during said certain control interval further comprises the steps of:

determining an accuracy of said calculated influence coefficient value;

increasing said gain parameter and reducing said forgetting factor if said calculated influence coefficient value is relatively accurate; and

decreasing said gain parameter and increasing said forgetting factor if said calculated influence coefficient value is relatively inaccurate.

Claim 37 (amended): The method of claim 34 further comprising the step of determining a vibrational value error for each control iteration, wherein said vibrational error

value is the sum of all disturbances present at a particular control iteration and the multiplicative product of any correction movement made during said particular control iteration.